



## SEQUENCE LISTING

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MAR 06 2002

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Roberts, Nicholas J.  
The Regents of the University of California

<120> LNP, a Protein Involved in the Initiation of  
Mycorrhizal Infection in Plants

<130> 023070-079820US

<140> US 09/657,631

<141> 2000-09-06

<160> 14

<170> PatentIn Ver. 2.1

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<212> DNA

<213> Dolichos biflorus

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<222> (51)..(1439)

<223> lectin nucleotide phosphohydrolase (LNP, NBP46 or  
DB46) root lectin

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Val His Val Phe Asn Phe Asp Gln Asn Leu Asp Leu Leu His Ile Gly
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Gly Lys Lys Tyr Asp Leu Tyr Val His Ser Tyr Leu Arg Tyr Gly Asn	
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cca gag caa gag att aca gtg gca gaa gga att gaa tat caa gat gcc 1352  
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Val Gly Asn Ser Ile Leu Leu Asn His Arg Lys Ile Leu Pro Asn Gln  
35 40 45  
Glu Leu Leu Thr Ser Tyr Ala Val Ile Phe Asp Ala Gly Ser Ser Gly  
50 55 60  
Ser Arg Val His Val Phe Asn Phe Asp Gln Asn Leu Asp Leu Leu His  
65 70 75 80

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Pro	Leu	Lys	Leu	Gly	Ala	Thr	Ala	Gly	Leu	Arg	Leu	Leu	Asp	Gly	Asp		
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root lectin

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cta ctc act aat cga aag att ttc caa aaa caa gaa acc tta acc tct	144
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Tyr Ala Val Ile Phe Asp Ala Gly Ser Thr Gly Thr Arg Val His Val	
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tac cat ttt gat cag aac tta gat cta ctt cac att ggc aat gat att	240
Tyr His Phe Asp Gln Asn Leu Asp Leu Leu His Ile Gly Asn Asp Ile	
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aca aaa tca gtg gga gta att gac ctt gga ggt ggt tca gtt caa atg	624
Thr Lys Ser Val Gly Val Ile Asp Leu Gly Gly Gly Ser Val Gln Met	
195 200 205	

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Leu	Pro	Gly	Phe	Asn	Gly	Thr	Phe	Thr	Tyr	Ser	Gly	Val	Glu	Tyr	Lys	
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Thr	Tyr	Pro	Arg	Leu	Thr	Asp	Ala	Lys	Arg	Pro	Tyr	Val	Cys	Met	Asp	
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Val Lys Ile Phe Gln Gln Leu Thr Leu Ser Lys Ile Lys Asn	
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Tyr Ala Val Ile Phe Asp Ala Gly Ser Thr Gly Thr Arg Val His Val	
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Tyr His Phe Asp Gln Asn Leu Asp Leu Leu His Ile Gly Asn Asp Ile	
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Met Trp Val Thr Val Asn Tyr Val Leu Gly Asn Leu Gly Lys Ser Phe	
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195 200 205	
Thr Tyr Ala Val Ser Lys Lys Thr Ala Lys Asn Ala Pro Lys Val Ala	
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Arg Ala Gln Val Leu Asn Ala Thr Asn Gly Ser Ala Asn Pro Cys Ile	
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Leu Pro Gly Phe Asn Gly Thr Phe Thr Tyr Ser Gly Val Glu Tyr Lys	
275 280 285	
Ala Phe Ser Pro Ser Ser Gly Ser Asn Phe Asp Asp Cys Lys Glu Ile	
290 295 300	

Ile Leu Lys Val Leu Lys Val Asn Asp Pro Cys Pro Tyr Pro Ser Cys  
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 325 330 335  
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 340 345 350  
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 Thr Tyr Pro Arg Leu Thr Asp Ala Lys Arg Pro Tyr Val Cys Met Asp  
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 405 410 415  
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Phe Leu Ile Ser Leu Met Thr Phe Val Phe Met Leu Met Pro Ala Ile	
20 25 30	
tct tcc tcc caa tat ctc gga aac aac att ctc atg aat cgt aag ata	144
Ser Ser Ser Gln Tyr Leu Gly Asn Asn Ile Leu Met Asn Arg Lys Ile	
35 40 45	
tta ctc ccc aaa aat cag gaa cca gtt aca tca tac gct gtt ata ttt	192
Leu Leu Pro Lys Asn Gln Glu Pro Val Thr Ser Tyr Ala Val Ile Phe	
50 55 60	
gat gct ggt agc act gga agc aga gtc cat gtc tac aat ttt gat cag	240
Asp Ala Gly Ser Thr Gly Ser Arg Val His Val Tyr Asn Phe Asp Gln	
65 70 75 80	
aac tta gat ctc ctt ccc gtt gaa aac gaa ctt gag ttt tat gat tcg	288
Asn Leu Asp Leu Leu Pro Val Glu Asn Glu Leu Glu Phe Tyr Asp Ser	
85 90 95	
gtt aaa ccc ggt ttg agt tca tac gct gct aat cct gaa gaa gct gca	336
Val Lys Pro Gly Leu Ser Ser Tyr Ala Ala Asn Pro Glu Glu Ala Ala	
100 105 110	
gaa tct ctg att cca ctt cta aaa gaa gca gaa aat gtg gtt cct gtg	384
Glu Ser Leu Ile Pro Leu Leu Lys Glu Ala Glu Asn Val Val Pro Val	
115 120 125	
agc cag caa ccc aac aca ccc gtt aag ctt ggg gca act gca ggt tta	432
Ser Gln Gln Pro Asn Thr Pro Val Lys Leu Gly Ala Thr Ala Gly Leu	
130 135 140	
agg ctt ttg gag ggg aat gct gct gaa aat ata ttg caa gcg gtc agg	480
Arg Leu Leu Glu Gly Asn Ala Ala Glu Asn Ile Leu Gln Ala Val Arg	
145 150 155 160	
gat atg ctc agc aac aga agt gcc ctt aat gtt caa tca gat gca gta	528
Asp Met Leu Ser Asn Arg Ser Ala Leu Asn Val Gln Ser Asp Ala Val	
165 170 175	
tct att ctt gat gga acc caa gaa ggt tct tat ctt tgg gtg aca att	576
Ser Ile Leu Asp Gly Thr Gln Glu Gly Ser Tyr Leu Trp Val Thr Ile	
180 185 190	
aac tat ctc ttg ggg aag ttg gga aaa aga ttt aca aag aca gtg gga	624
Asn Tyr Leu Leu Gly Lys Leu Gly Lys Arg Phe Thr Lys Thr Val Gly	
195 200 205	

gta gtt gat cta gga ggt ggg tca gtg caa atg aca tat gca gtc tca	672
Val Val Asp Leu Gly Gly Gly Ser Val Gln Met Thr Tyr Ala Val Ser	
210 215 220	
agg aac aca gct aaa aat gct cca aaa gta cct gaa gga gag gat cca	720
Arg Asn Thr Ala Lys Asn Ala Pro Lys Val Pro Glu Gly Glu Asp Pro	
225 230 235 240	
tac ata aag aag ctt gta ctc cag gga aag aaa tat gac ctt tat gtt	768
Tyr Ile Lys Lys Leu Val Leu Gln Gly Lys Lys Tyr Asp Leu Tyr Val	
245 250 255	
cac agt tac ttg cgc tat gga aga gaa gca ttt cgt gca gag att ttc	816
His Ser Tyr Leu Arg Tyr Gly Arg Glu Ala Phe Arg Ala Glu Ile Phe	
260 265 270	
aag gtc gct ggt ggt tct gct aat cct tgc att tta gct ggc ttt gat	864
Lys Val Ala Gly Gly Ser Ala Asn Pro Cys Ile Leu Ala Gly Phe Asp	
275 280 285	
ggg gca tat aca tat tcc gga gca gag tat aag gtc tcg gcc cca gct	912
Gly Ala Tyr Thr Tyr Ser Gly Ala Glu Tyr Lys Val Ser Ala Pro Ala	
290 295 300	
tca gga tct aac ttg aat caa tgc aga aag ata gct ctt aag gct ctt	960
Ser Gly Ser Asn Leu Asn Gln Cys Arg Lys Ile Ala Leu Lys Ala Leu	
305 310 315 320	
aaa gtg aat gca cct tgt ccc tat cag aat tgc act ttt ggt ggg ata	1008
Lys Val Asn Ala Pro Cys Pro Tyr Gln Asn Cys Thr Phe Gly Gly Ile	
325 330 335	
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Trp Asn Gly Gly Gly Gly Ser Gly Gln Lys Asn Leu Phe Leu Thr Ser	
340 345 350	
tct ttc tat tac ctc tct gaa gat gtt ggg atc ttt gtg aat aaa ccc	1104
Ser Phe Tyr Tyr Leu Ser Glu Asp Val Gly Ile Phe Val Asn Lys Pro	
355 360 365	
aat gcc aaa att cgt cca gtt gat ttg aag act gca gct aaa cta gct	1152
Asn Ala Lys Ile Arg Pro Val Asp Leu Lys Thr Ala Ala Lys Leu Ala	
370 375 380	
tgt aaa aca aat ctt gag gat gca aaa tcc aaa tac cca gat ctt tat	1200
Cys Lys Thr Asn Leu Glu Asp Ala Lys Ser Lys Tyr Pro Asp Leu Tyr	
385 390 395 400	
gag aaa gac agt gtt gaa tat gtg tgc ttg gat ctt gtc tac gtg tac	1248
Glu Lys Asp Ser Val Glu Tyr Val Cys Leu Asp Leu Val Tyr Val Tyr	
405 410 415	
aca ttg ctt gtt gat gga ttt ggt ctt gat cca ttt caa gag gtt aca	1296
Thr Leu Leu Val Asp Gly Phe Gly Leu Asp Pro Phe Gln Glu Val Thr	
420 425 430	
gtg gcg aat gaa att gaa tat cag gat gct ctt gtg gaa gcc gca tgg	1344
Val Ala Asn Glu Ile Glu Tyr Gln Asp Ala Leu Val Glu Ala Ala Trp	
435 440 445	

cct cta ggc act gcc ata gaa gca ata tca tca ttg cct aaa ttt gag 1392  
 Pro Leu Gly Thr Ala Ile Glu Ala Ile Ser Ser Leu Pro Lys Phe Glu  
 450 455 460

aga tta atg tat ttt att taa act act agt acc tgc tta agc ctg gat 1440  
 Arg Leu Met Tyr Phe Ile Thr Thr Ser Thr Cys Leu Ser Leu Asp  
 465 470 475 480

tac ctg aag aaa taa aat gaa ata aaa gcc gca tct ttc ttc ctt gct t 1489  
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 root lectin

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 Asn Ile Leu Met Asn Arg Lys Ile Leu Leu Pro Lys Asn Gln Glu Pro  
 35 40 45  
 Val Thr Ser Tyr Ala Val Ile Phe Asp Ala Gly Ser Thr Gly Ser Arg  
 50 55 60  
 Val His Val Tyr Asn Phe Asp Gln Asn Leu Asp Leu Leu Pro Val Glu  
 65 70 75 80  
 Asn Glu Leu Glu Phe Tyr Asp Ser Val Lys Pro Gly Leu Ser Ser Tyr  
 85 90 95  
 Ala Ala Asn Pro Glu Glu Ala Ala Glu Ser Leu Ile Pro Leu Leu Lys  
 100 105 110  
 Glu Ala Glu Asn Val Val Pro Val Ser Gln Gln Pro Asn Thr Pro Val  
 115 120 125  
 Lys Leu Gly Ala Thr Ala Gly Leu Arg Leu Leu Glu Gly Asn Ala Ala  
 130 135 140  
 Glu Asn Ile Leu Gln Ala Val Arg Asp Met Leu Ser Asn Arg Ser Ala  
 145 150 155 160  
 Leu Asn Val Gln Ser Asp Ala Val Ser Ile Leu Asp Gly Thr Gln Glu  
 165 170 175  
 Gly Ser Tyr Leu Trp Val Thr Ile Asn Tyr Leu Leu Gly Lys Leu Gly  
 180 185 190  
 Lys Arg Phe Thr Lys Thr Val Gly Val Val Asp Leu Gly Gly Gly Ser  
 195 200 205  
 Val Gln Met Thr Tyr Ala Val Ser Arg Asn Thr Ala Lys Asn Ala Pro  
 210 215 220

Lys Val Pro Glu Gly Glu Asp Pro Tyr Ile Lys Lys Leu Val Leu Gln  
 225 230 235 240  
 Gly Lys Lys Tyr Asp Leu Tyr Val His Ser Tyr Leu Arg Tyr Gly Arg  
 245 250 255  
 Glu Ala Phe Arg Ala Glu Ile Phe Lys Val Ala Gly Gly Ser Ala Asn  
 260 265 270  
 Pro Cys Ile Leu Ala Gly Phe Asp Gly Ala Tyr Thr Tyr Ser Gly Ala  
 275 280 285  
 Glu Tyr Lys Val Ser Ala Pro Ala Ser Gly Ser Asn Leu Asn Gln Cys  
 290 295 300  
 Arg Lys Ile Ala Leu Lys Ala Leu Lys Val Asn Ala Pro Cys Pro Tyr  
 305 310 315 320  
 Gln Asn Cys Thr Phe Gly Gly Ile Trp Asn Gly Gly Gly Gly Ser Gly  
 325 330 335  
 Gln Lys Asn Leu Phe Leu Thr Ser Ser Phe Tyr Tyr Leu Ser Glu Asp  
 340 345 350  
 Val Gly Ile Phe Val Asn Lys Pro Asn Ala Lys Ile Arg Pro Val Asp  
 355 360 365  
 Leu Lys Thr Ala Ala Lys Leu Ala Cys Lys Thr Asn Leu Glu Asp Ala  
 370 375 380  
 Lys Ser Lys Tyr Pro Asp Leu Tyr Glu Lys Asp Ser Val Glu Tyr Val  
 385 390 395 400  
 Cys Leu Asp Leu Val Tyr Val Tyr Thr Leu Leu Val Asp Gly Phe Gly  
 405 410 415  
 Leu Asp Pro Phe Gln Glu Val Thr Val Ala Asn Glu Ile Glu Tyr Gln  
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20

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PCR primer

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17